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| 26158 7590 07/10/2008 WOMBLE CARLYLE SANDRIDGE & RICE, PLLC ATTN: PATENT DOCKETING 32ND FLOOR P.O. BOX 7037 ATLANTA, GA 30357-0037 | | | | |
| EXAMINER | | | | |
| BERNS, DANIEL J | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 4162 | | | | |
| NOTIFICATION DATE | | DELIVERY MODE | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PatentDocketing@WCSR.COM

Office Action Summary

Application No.

10/526,336

Applicant(s)

FOERSTER, MARCEL

Examiner

DANIEL BERNS, ESQ.

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-32 is/are rejected.
- 7) ☒ Claim(s) 19 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date March 2, 2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: the specification contains the term “benzole sulfonic acid.” *See* applicant’s Pre-grant Publication, US 2006/0148639 (published July 6, 2006) at par. 0014. As “benzole” is a German-language synonym for “benzene,” and the latter is significantly more easily recognized by readers in the United States, applicant is advised to change the objected-to term to “benzene sulfonic acid” or “benzenesulfonic acid.” A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is required. The substitute specification filed must be accompanied by a statement that it contains no new matter. Appropriate correction is required.

Claim Objections

2. Claim 19 is objected to because of the following informalities: the term “benzole sulfonic acid” appears therein. For the reasons stated above, applicant is advised to change the objected-to language to “benzene sulfonic acid” or “benzenesulfonic acid.” Appropriate correction is required.
3. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claim 23 (2nd iteration) has been renumbered as claim "24" and treated as such for examination purposes. Applicant is required to renumber all claims following claim 23 (1st iteration), starting with 24 and so on, ending with renaming claim 31 as claim 32.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 32 recites the limitation "the activator elements[.]" There is insufficient antecedent basis for this limitation in the claim. Said claim is thus rejected under 35 U.S.C. § 112, 2nd par.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19-20, 24 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Obayashi et al., Pat. No. 4,615,991 (1986) ("Obayashi") in view of Friesen et al., Pat. No. 6,136,222 (2000) ("Friesen"). Obayashi discloses the regeneration of iron-fouled denitration (herein "DENOX") catalysts exhibiting decreased denitrating performance and an elevated SO₂/SO₃ conversation rate by washing with aqueous sulfuric or oxalic acids at temperatures of 20-60 deg. C and pH of 0.5 to 4.0, followed by an aqueous wash, drying and re-impregnation of the DENOX catalysts with water-soluble catalytically-active materials or precursors thereof. *See*

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Obayashi at col. 2, ln. 40-49, col. 3, ln. 47-55, col. 7, ln. 59-68, and clms. 1-3. However, Obayashi does not disclose the use of antioxidants/reducing agents in its regeneration process. This limitation is taught by Friesen, who discloses the regeneration of a transition-metal nitrogen-removing catalyst complex comprising (*inter alia*) the metal and a compound selected from the group consisting of (*inter alia*) dithiocarbonates and catecholates, *see* Friesen at clms. 1 and 4, by treatment with aqueous hydrochloric or sulfuric acid. *See id.* at col. 19, ln. 28-33, 42-47, and 62-64. Given that Friesen's catalyst complex is regenerated by an acid washing similar to Obayashi's, and that the use of antioxidants would presumably at least partially prevent the oxidation of more soluble inorganic ferrous compounds to their less soluble, ferric counterparts, or reverse the same, adding an antioxidant to the catalyst regeneration mixture such as those taught by Friesen would reasonably be expected to increase the efficiency of iron removal from the used DENOX catalyst in Obayashi. As such, performing Obayashi's process with its formulation therefor in addition to Friesen's antioxidant additive would have been obvious to one of ordinary skill in the art at the time of the invention. Further, applicant's limitation in claim 19 that the method be carried out "under such conditions that regeneration of the denox catalysts is effected["] provides no structural, methodological, or other guidance as to the method employed, rather merely stating that the regeneration should be performed under such conditions that it produces successful results. Said circular logic renders the above-quoted limitation mere surplusage, and as such it is deemed of no patentable weight. As such, claims 19-20, 24 and 31-32 are rejected under 35 U.S.C. 103(a) as obvious over Obayashi in view of Friesen.

7. Claim 23 is rejected under 35 U.S.C. 103(a) as obvious over Obayashi in view of Friesen, further in view of Duke et al., Pat. No. 6,080,696 (2000) ("Duke"). Whereas Obayashi and

Friesen do not disclose the use of an antioxidant/reducing agent in amounts of 0.2 to 2.0 wt.%, Duke's teaching of the use of an antioxidant/reducing agent (sodium dithionite, *see id.* at col. 2, ln. 40-41) in amounts of approx. 13.5 wt.%, *see id.* at col. 3, ln. 63-67. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *See, e.g., In re Boesch*, 617 F.2d 272,205 USPQ 215 (CCPA 1980). Given that Duke's disclosure is directed toward the removal of mineral foulings, employing Duke's proportion of antioxidant/reducing agent, or variations thereof, with Obayashi and Friesen's formulation and methodology for regenerating iron-fouled DENOX catalysts would have been obvious to one of ordinary skill in the art at the time of the invention. As such, claim 23 is rejected under 35 U.S.C. 103(a) as obvious over Obayashi in view of Friesen, further in view of Duke.

8. Claim 21 is rejected under 35 U.S.C. 103(a) as obvious over Obayashi in view of Friesen, further in view of Trinh et al., Pat. No. 4,830,997 (1989) ("Trinh"). Whereas Obayashi and Friesen do not disclose the use of ascorbic and/or isoascorbic acid for their catalyst regeneration procedures, Trinh teaches that, *inter alia*, citric acid, oxalic acid, and ascorbic acid are all relatively equally well-suited for use in regenerating iron-fouled catalysts. *See Trinh* at col. 10, ln. 45-50. Given the interchangeability of ascorbic for oxalic acid for such a procedure as taught by Trinh, such a substitution for use in Obayashi's process and formulation in the presence of Friesen's additive may reasonably have been expected to yield favorable results therefor. As such, the use of ascorbic acid in the above-detailed catalyst regeneration procedure would have been obvious to one of ordinary skill in the art at the time of the invention. Claim 21 is thus rejected under 35 U.S.C. 103(a) as obvious over Obayashi in view of Friesen, further in view of Trinh.

9. Claims 22 and 25-30 are rejected under 35 U.S.C. 103(a) as obvious over Obayashi in view of Friesen, further in view of Dittmer et al., Pat. No. 6,241,826 (2001) ("Dittmer") and Budin et al., Pre-grant Publication No. US2001/0006929 (published July 5, 2001) ("Budin"). Whereas Obayashi and Friesen do not disclose the use of various surfactants in their catalyst cleansing formulation, constantly moving/agitating said cleaning solution, applying mechanical vacuum or water-spray pretreatments to remove fine dust from the catalyst, or employing a sonication treatment following the cleansing treatment in a secondary basin in their method of regenerating iron-fouled DENOX catalysts, these limitations are taught by Dittmer and Budin. Dittmer teaches the use of cationic or anionic surfactants in its catalyst cleansing mixture, *see* Dittmer at col. 5, ln. 9-13, the consistent movement of the catalyst (and thus its carrier structure) within and throughout the cleansing mixture during its exposure time thereto, *see id.* at col. 2, ln. 15-19, and a dry vacuuming and/or pressurized water-washing pre-treatment step prior to immersion of the catalyst into the cleansing mixture. *See id.* at col. 1, ln. 66 to col. 2, ln. 7. Dittmer additionally teaches the sonication of said catalyst, in a separate treatment basin, so as to loosen and remove tenacious, insoluble detritus from the catalyst. *See id.* at col. 2, ln. 33-48. Further, and with some overlap in teachings, Budin teaches the use of anionic or non-ionic surfactants in regenerating used DENOX catalysts, along with acoustic irradiation of the catalyst/cleansing composition mixture within a frequency range of <20Hz to >20kHz. *See* Budin at par. 0014-15 and 0018-19. Given that Dittmer and Budin's formulations and processes are both drawn toward regeneration of used DENOX catalysts, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply Dittmer and Budin's methodologies and additives to those of Obayashi and Friesen for the regeneration of used

DENOX catalysts. As such, claims 22 and 25-30 are rejected under 35 U.S.C. 103(a) as obvious over Obayashi in view of Friesen, further in view of Dittmer and Budin.

10. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Young, Pat. No. 5,099,014 (1992) ("Young"). Young teaches that reducing iron compounds, i.e.: from the ferric to ferrous ion state, leads to increased solubilities thereof. While this art's teaching is but of a general technical nature, it nevertheless further illustrates the applicability of Obayashi and Friesen's teachings to the acid-assisted removal of iron fouling from DENOX catalysts and the resulting regeneration thereof.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL BERNES, ESQ. whose telephone number is (571)270-5839. The examiner can normally be reached on Monday thru Thursday, 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571)272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DB/ July 3, 2008

/Jennifer McNeil/
Supervisory Patent Examiner, Art Unit 4162